

4.0

TECHNICAL APPROACH

This section presents the technical approach for implementation of the FS.

4.1 TASK 1 DESCRIPTION OF CURRENT SITUATION AND PROPOSED RESPONSE

4.1.1 Task 1A Description of Current Situation

4.1.1.1 Description of Site Background

Under this task, a summary of the existing Site background information necessary to understand the environmental issues and site conditions will be prepared. This summary will include an evaluation of the following:

- C Site description and location
- C Site operational history and background
- C Site land use and potential development
- C Site regulatory history and background
- C Previous investigation and response activities

4.1.1.2 Summary of Nature and Extent of Contamination

Under this task, a summary of nature and extent of contamination will be prepared from existing information. The information summarized will be taken from the results of previous investigations and response activities at the Site.

4.1.2 Task 1B Preliminary Remedial Action Objectives, Preliminary General Response Actions and Preliminary Identification of Potential ARARs

4.1.2.1 Preliminary Remedial Action Objectives

Using the existing Site information summarized in Task 1A, the data will be analyzed to identify the contaminated media, potential contaminants and potential routes of exposure and associated receptors. Preliminary remedial action objectives will be identified for each contaminated medium.

4.1.2.2 Preliminary General Response Actions

The preliminary general response actions will be identified. The preliminary general response actions will be based upon the potential routes of exposure and associated receptors identified at this time. The identification of preliminary general response actions will allow a preliminary identification of potential Applicable or Relevant and Appropriate Requirements (ARARs).

4.1.2.3 Preliminary Identification of Potential ARARs

A preliminary identification of potential ARARs and To Be Considered (TBC) information will be developed. Potential chemical specific and location-specific ARARs will be identified on the basis of the evaluation of the existing Site data. Identification of potential ARARs will continue throughout the FS as a better understanding of the site conditions, contaminants and alternatives becomes available.

4.1.3 Task 1C Identification and Screening of Preliminary Remedial Technologies

Preliminary remedial technologies will be identified for each preliminary general response action. These preliminary remedial technologies will be screened to eliminate those that cannot be implemented technically at the site. During this step, the only screening criterion is technical implementability. The identification and screening of technologies step will be based on data contained in the graphical representation of historic data deliverable described in Section 4.0 of the IWP. Factors that influence technical implementability include site specific conditions such as location of contamination, physical characteristics of the Site, subsurface conditions and contaminant mobility.

Preliminary technology process options will be identified and evaluated to select a representative process for each preliminary remedial technology type considered technically implementable and retained for consideration. Technology process options refer to specific processes within each technology type. Specific technology process options selected are intended to represent the broader range of process options within a general technology type. Preliminary technology process options are screened on the basis of effectiveness, implementability, and cost.

- C Effectiveness relates to the short-term (during implementation) and long-term protectiveness provided by the process option (i.e., continued maintenance of health and environmental risks below potential remediation goals), and the reduction achieved in toxicity, mobility, or volume. Effectiveness relates to how well the process option can handle the media and meet the potential remediation goals, its potential impacts to human health and the environment during construction and implementation and how proven and reliable the process is with respect to the site contaminants and conditions.

- C Implementability relates to technical practicality and feasibility (i.e., ability to construct and reliably operate the system and meet regulations); and administrative feasibility (i.e., ability to get permits where needed, to procure treatment, storage and disposal services, and to procure needed equipment and expertise) to implement the technology.
- C Cost screening at this stage involves relative capital and operating and maintenance (O&M) costs to allow elimination of significantly more costly technology process options, especially within one remedial technology type. The costs are categorized as low, medium, or high relative to other technology process options in the same preliminary remedial technology type.

Although historic data will be used to begin the remedial technologies screening process, the results of this preliminary technology and preliminary technology process option screening will be reevaluated during Task 2B (Section 4.2.2) and used to develop alternatives.

4.1.4 Task 1D Statement of Purpose

Under this task a statement of purpose will be presented which will include a summary of the nature and extent of contamination based on the results and evaluation of data from the RI. In addition, the statement of purpose will include a summary of the potential exposure pathways described in the approved draft HERA Report.

4.2 TASK 2 DEVELOPMENT OF ALTERNATIVES

This section presents the technical approach for developing alternatives in the FS.

4.2.1 Task 2A Establishment of Remedial Response Objectives

Remedial Action Objectives (RAOs) are medium-specific, remediation objectives that are established based on the nature and extent of contamination and the potential for human and environmental exposure. They are site-specific, quantitative goals that define the extent of action required to achieve specific objectives. RAOs are generally based on public health and environmental concerns and information gathered during the RI. The RAOs for this Site will be developed through a refinement of the preliminary RAOs developed in Task 1B (Section 4.1.2.1) to incorporate EPA comments on the Draft HERA Report and the results contained in the Draft RI Report.

The RAOs will specify the contaminants of concern, potential exposure pathways and preliminary remediation goals (an estimate of a range of contaminant levels expected to be acceptable for each potential exposure pathway). The results of the risk characterization developed during the HERA will be used to calculate risk based goals for the sediment.

4.2.2 Task 2B Development of Alternative Remedial Actions

The development of alternatives will involve the following steps:

- C Utilize RAOs developed in Task 2A.
- C Refine the preliminary general response actions developed under Task 1B to incorporate EPA comments on the Draft HERA Report and the results contained in the Draft RI report.
- C Estimate volumes and areas of media to which general response actions may be applied based on information contained in the Draft RI report.

- C Refine preliminary remedial technologies and preliminary technology process options developed in Task 1C to incorporate EPA comments on the Draft HERA Report and the results contained in the Draft RI report.
- C Assemble the selected remedial technologies into alternatives representing a range of institutional controls, excavation, containment, and treatment combinations, as appropriate.

The alternatives developed in general terms during this phase of the FS will be medium specific and will represent a range of options. Alternatives to be evaluated will include:

- C Alternatives for source control of contaminated river sediments that would eliminate the need for long-term management (including monitoring).
- C Alternatives involving treatment as the principal element to reduce the toxicity, mobility, or volume of waste.
- C Alternatives that involve containment of waste with little or no treatment, but provides protection of human health and the environment primarily by preventing potential exposure or reducing the mobility of the waste.
- C A no action alternative.

4.3 TASK 3 INITIAL SCREENING OF ALTERNATIVES

Prior to screening alternatives, additional definition of the alternatives may be necessary to provide a basis for evaluation and comparison. Issues that may require this additional definition include:

C Remedial Action Objectives

During screening, the alternatives will be evaluated to confirm that they are protective of human health and the environment for each potential exposure pathway identified in the Draft HERA Report and EPA comments to the Draft HERA Report.

C Media Definition

Refinement of estimates of volumes or areas of contaminated media may be necessary for use in screening alternatives.

C Technology Process Options

Technology process options will be defined more fully, so that differences between alternatives can be identified. The following information will be developed for each technology process option used:

- Time frame in which preliminary remediation goals can be achieved through excavation, treatment, or containment
- Size and configuration of potential on-site extraction and treatment systems or containment structures
- Rates or flows associated with treatment of the medium by a given technology process option
- Spatial requirements for potential treatment systems or containment structures

- Approximate distances for transport to potential offsite treatment and disposal facilities
- Permit and legal considerations

4.3.1 Task 3A Alternatives

Following this additional definition of the alternatives, the alternatives developed in Task 2 will be evaluated against the short-term and long-term aspects of three broad criteria: effectiveness, implementability, and cost. These are the same general criteria used to screen technology process options, as discussed in Section 4.1.3. As part of the evaluation with respect to long-term effectiveness, the potential for continued contamination from off-site sources will be considered. The cost evaluation for the assembled alternatives will be more detailed than for the technology process options. The alternatives will be defined so that preliminary cost estimates can be developed for each alternative. These estimates will be based on vendor information, cost curves, generic unit costs, conventional cost-estimating guides, and prior similar estimates as modified by Site-specific information. Both capital cost and O&M estimates will be developed at this stage. Present worth analyses will be used to compare alternatives on the basis of a single cost. Present worth analysis for calculating long-term costs will use an interest rate of 5% as specified by the RI/FS guidance. The purpose of the screening evaluation is to reduce the number of alternatives that undergo a more thorough and extensive analysis; therefore, alternatives will be evaluated more generally in this phase than during the detailed analysis. A range of alternatives to the extent practical, some of which may include treatment or containment remedial technology types, as well as a no action alternative, will be maintained at this stage of the FS.

4.3.2 Task 3B Alternatives Array Document

The preliminary chemical-specific and location-specific potential ARARs and TBC information will be refined based on the results contained in the Draft RI report. Action-specific potential ARARs will be developed based on the alternatives assembled in Task 2B. These include:

- C Chemical-specific Potential ARARs: define acceptable exposure levels or target concentrations in various media for specific contaminants

- C Location-specific Potential ARARs: set restrictions on activities within specific locations such as floodplains, streams or wetlands

- C Action-specific Potential ARARs: set controls or restrictions for particular treatment and disposal remedial technology types

Upon completion of Task 3A, an alternatives array document will be prepared to support the potential ARAR review. The document will summarize the work performed in Task 1, 2, and 3A that includes the site description, development of RAOs, general response actions, identification and screening of remedial technologies and technology process options, and alternatives development and screening. Review of potential ARARs will continue throughout the FS process. Potential treatability study requirements will be identified, if any.

If insufficient alternatives remain after the screening process to conduct a detailed evaluation, alternative(s) will be identified in the alternatives array document for further evaluation in a focused feasibility study.

The report performed under this task will be submitted to EPA and New Jersey Department of Environmental Protection NJDEP according to the schedule identified in Section 5 of this FSWP.

4.4 TASK 4 TREATABILITY STUDIES

[RESERVED]

4.5 TASK 5 EVALUATION OF THE ALTERNATIVES

The detailed analysis of alternatives will be performed under Tasks 5A and 5B. The detailed analysis will present the following:

- C further definition of each retained alternative with respect to the volume, mass or area of contaminated media to be addressed, the remedial technology types to be used, and any performance requirements associated with those remedial technology types
- C an assessment of each retained alternative against seven NCP evaluation criteria
- C a comparative analysis among the retained alternatives to assess relative potential performance of each retained alternative with respect to seven NCP evaluation criteria

The results of the detailed analysis will provide the basis for recommending a preferred alternative.

4.5.1 Task 5A Evaluation of the Alternatives

Alternatives that have been retained as a result of the alternative screening may need to be better defined during the detailed analysis. In order to develop a cost estimate to a general accuracy of +50 percent to -30 percent, the following items may be needed: preliminary design calculations, process flow diagrams, sizing of key process components, preliminary site layouts, and a discussion of limitations, assumptions, and uncertainties concerning each alternative. This information will be incorporated into a detailed description of each alternative. Once the alternatives are defined, they will be evaluated with respect to the seven criteria that have been developed to address the NCP requirements and technical and policy considerations (NCP, 1990).

The seven evaluation criteria are:

- C Overall Protection of Human Health and the Environment - how the alternative provides human health and environmental protection
- C Compliance with ARARs - compliance with chemical-specific, action-specific, and location-specific ARARs and other TBC information approved by EPA
- C Long-Term Effectiveness and Permanence - assessment of the magnitude of residual risk remaining from untreated media and treatment residuals and adequacy and reliability of controls, if any, that are used to manage untreated media or treatment residuals; and assessment of continued contamination from off-site sources
- C Reduction of Toxicity, Mobility, and Volume through Treatment - technology process options used and materials treated, amount of

hazardous materials destroyed or treated, degree of expected reductions in toxicity, mobility, and volume, degree to which treatment is irreversible, and type and quantity of residuals remaining after treatment

- C Short-Term Effectiveness - protection of community and workers during remedial actions, environmental impacts, and time until remedial action objectives are achieved
- C Implementability - ability to construct and operate the alternative, reliability of the alternative, ease of utilizing additional remedial technology types if necessary, ability to monitor effectiveness of remedy, ability to obtain approvals from other agencies, coordination with other agencies, availability of offsite treatment, storage, and disposal services, availability of necessary equipment/specialists, and availability of prospective remedial technologies
- C Cost - capital, O&M, and present worth costs

The other two NCP criteria specified in NCP 1990, state acceptance and community acceptance, will be evaluated by EPA following comment on the Proposed Plan.

4.5.2 Task 5B Comparison of Alternatives

Once the detailed analysis is complete for each retained alternative, the same seven criteria will be used in a comparison among alternatives. This comparative analysis will be used to identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs can be determined to aid in recommending a recommended remedial alternative. In this process, emphasis will be placed on overall protection of human health and the environment and compliance with ARARs.

4.6 TASK 6 DRAFT FEASIBILITY STUDY REPORT

A Draft FS Report will be prepared which will present the results of the FS. The report will present a summary of the characterization of the Site and will present the remedial action objectives and general response actions. The various steps of the identification and screening of remedial technology types and technology process options, and the screening of alternatives will be presented. The report will present the alternatives which will be considered further for implementation as well as those alternatives not appropriate for further evaluation and the reasons for their elimination. A detailed analysis of the retained alternatives will be reported. The report will conclude with a recommended remedial alternative and a conceptual design for the recommended remedial alternative.

The draft FS report will follow the format suggested in EPA 1988 and will be comprised of the following six sections and any pertinent appendixes:

- Section 1.0 Introduction - incorporates work performed in Task 1A and 1D
- Section 2.0 Identification and Screening of Technologies - incorporates work performed in Task 1C, 2A, 2B and 3B
- Section 3.0 Development and Screening of Alternatives - incorporates work performed in Task 2B, 3A
- Section 4.0 Detailed Analysis of Alternatives - incorporates work performed in Tasks 5A and 5B
- Section 5.0 Conceptual Design of the Recommended Remedial Alternative
- Section 6.0 References

The work performed under this task will be submitted according to the schedule identified in Section 5 of this work plan.

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5.0 SCHEDULE

Since implementation of the FS is contingent upon receiving information and data from other phases of the work being conducted under this AOC, submittal dates for deliverables required under this FSWP are dependent upon completion of a variety of prerequisite events. Therefore, the schedule for submittal of these deliverables is expressed in terms of a period of time following completion of prerequisite events required to complete the deliverable.

The schedule for submittal of deliverables required under this FSWP is presented in Table 5-1, expressed in terms of time required following completion of the associated prerequisite events. The schedule does not include conduct of any laboratory or bench scale treatability studies which may be required by EPA under the provisions of AOC Section VII, Paragraph 42.b, nor does it include conduct of a pilot scale treatability study which may be required by EPA under the provisions of AOC Section VII, Paragraph 42.c. Should EPA require any such studies and whether OCC or EPA performs such studies, OCC shall submit a revised schedule in the treatability study work plan for submittal of any affected deliverables under this FSWP to the EPA for review and approval. The schedule also does not include conduct of any additional work which EPA may determine is required under the provisions of AOC Section VII, Paragraph 45. Should EPA require any such additional work and whether OCC or EPA performs such additional work, OCC shall submit a revised schedule for submittal of any affected deliverables under this FSWP to the EPA for review and approval.

Under the Feasibility Study, the duration of the Alternatives Array Document work is given as 763 days. This time period is reflective of the fact that completion of portions of this Alternatives Array Document are dependent upon completion of other phases of

the AOC work. The Feasibility Study Tasks 1A (Description of the Current Situation), 1B (Identification of Preliminary Remedial Action Objectives, Preliminary General Response Actions, and Preliminary Identification of Potential ARARs) and 1C (Identification and Screening of Preliminary Remedial Technologies) can be initiated upon EPA approval of the FSWP (see Section 4.0 for a detailed task description). Task 1D (Statement of Purpose) can be initiated once the analytical data are obtained from the RI (corresponds to the end of Item 8 on Figure 5-1) and OCC receives comment on the HERA Report (item 13 on Figure 5-1). The other Feasibility Study Tasks (2 and 3A) that must be completed before preparation of the Alternatives Array Document are dependent upon the results from the risk assessment from the draft HERA and the sediment mobility modeling of the stressed condition (item 27 on Figure 5-1) and therefore can be initiated after receipt of written comments on the draft HERA, or after completion of the Calibration/Verification Evaluation and Report (item 25 on Figure 5-1), whichever is later.

The estimated schedule for implementation of the combined RI/FS is presented in Figure 5-1. The estimated schedule is date dependent and is presented in terms of periods of time following receipt of approval of the FSWP and other identified project deliverables, rather than in calendar dates (date definite).

The schedule for the FS includes the following activities and events:

- C Submittal of the Alternatives Array Document to the EPA
- C Receipt of EPA Approval of the Alternatives Array Document
- C Receipt of EPA Acceptance of ARARs

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C Task 4 Treatability Studies has been reserved and not included in the schedule at this time. If treatability studies are required, the FS schedule will be revised.

C Submittal of the Draft FS Report to the EPA

The schedule for submittal of the amended Draft FS Report and submittal of the modified Draft FS Report are provided in AOC Section VII, Paragraph 43.a and 44 respectively.

TABLE 5-1

**PREREQUISITE EVENTS AND TIME REQUIRED FOR SUBMITTAL
OF REPORTS DESCRIBED IN FEASIBILITY STUDY WORK PLAN**

			Time Required Following Prerequisite Event (Calendar Days)
	Report or Plan	Prerequisite Event	
C	Submittal of Alternatives Array Document (SOW Section G.3.TASK 3.B)	Receipt of written notification of approval of RIWP (AOC Section VII, Paragraph 35)	763
		Receipt of written comment on Draft HERA (AOC Section VII, Paragraph 39.c)	120
		Receipt of written notification of approval of FSWP (AOC Section VII, Paragraph 41.b)	120
NOTE:	For each report or plan, the submittal date will be the latest of the dates obtained by adding the time required to the date of each prerequisite event		

**TABLE 5-1
(Concluded)**

	Report or Plan	Prerequisite Event	Time Required Following Prerequisite Event (Calendar Days)
C	Submittal of Draft Feasibility Study Report (AOC Section VII, Paragraph 42.a)	Receipt of EPA written notification of approval of the Alternatives Array Document (SOW Section G.3. Task 3.b)	120
		Receipt of written notification of acceptance of ARARs from EPA	90
		Receipt of EPA written notification of approval of final RI Report (AOC Section VII, Paragraph 38, Amended Draft RI Report)	90
		Receipt of EPA approval of final HERA Report (AOC Section VII, Paragraphs 39.c and .d)	90

NOTE: For each report or plan, the submittal date will be the latest of the dates determined by adding the time required following each given prerequisite event to the date of completion of the given prerequisite events.

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The format of this document may appear slightly different from the version submitted to US EPA (1995) due to changes in software. There has been no change in content.

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